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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/541,717

10/24/2005

Richard Quentin Carmichael

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DUANE MORRIS LLP - Philadelphia  
IP DEPARTMENT  
30 SOUTH 17TH STREET  
PHILADELPHIA, PA 19103-4196

EXAMINER

SCHNEIDER, CRAIG M

ART UNIT

PAPER NUMBER

3753

MAIL DATE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/541,717	<b>Applicant(s)</b> CARMICHAEL, RICHARD QUENTIN	
	<b>Examiner</b> CRAIG M. SCHNEIDER	<b>Art Unit</b> 3753	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21,23,24 and 26 is/are pending in the application.  
     4a) Of the above claim(s) 16-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15,20,21,23,24 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/26/08 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 15 recites the limitation "the contact surface" in line 2. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1, 2, 7, 8, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Borg et al. (3,780,767).

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Borg et al. disclose a vortex chamber (41), an inlet (40) and a single outlet (42), the vortex chamber defining a void and having a longitudinal axis extending through the void, the inlet being disposed to admit fluid into the chamber in a tangential direction with respect to the longitudinal axis of the vortex chamber so as to promote a rotational flow of the fluid within the vortex chamber and about the longitudinal axis, thereby to generate a low pressure region within the fluid that is centered on the longitudinal axis, and the outlet comprising an escape aperture situated at an axial end of the chamber so as to open into the low pressure region.

Regarding claim 9, the vortex chamber is provided in a control element (PS) supported by a body (20) provided with inlet (21 to inner surface of PS) and outlet (outer surface of PS) passages. The inlet passage communicating with the inlet to the chamber and the outlet passage communicating with the escape aperture.

Regarding claim 14, the control element is secured to the body by a cap (28).

7. Claims 1, 3, 6-9, 15, 23, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Moore (2,020,563).

Moore discloses a condensate trap (10 and 11) comprising a vortex chamber (29). The trap further comprising an inlet (14) and a single outlet (16). The vortex chamber defining a void (area above 27 and below 16) and having a longitudinal axis extending through the void. The inlet being disposed to admit fluid into the chamber in a tangential direction with respect to the longitudinal axis of the vortex chamber so as to promote a rotational flow of the fluid within the vortex chamber about the longitudinal axis, thereby to generate a low pressure region within the fluid that is centered on the

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longitudinal axis. The outlet comprising an escape aperture situated at an axial end of the chamber so as to open into the low pressure region in operation of the condensate trap (page 2, col. 2, line 43 to page 3, col. 2, line 8).

Regarding claim 9, the vortex chamber is provided in a control element (27) supported by a body provided with inlet (15) and outlet (18) passages. The inlet passage communicating with the inlet to the chamber and the outlet passage communicating with the escape aperture.

Regarding claim 13, the inlet is one of a plurality of inlets (33) which are directed tangentially of the chamber and are distributed equally around the chamber.

Regarding claim 14, the control element is secured to the body by a cap (11).

Regarding claim 15, the chamber is open at a face of the control element opposite the contact surface (area through 16), the chamber being closed by the cap.

Regarding claim 24, the functional recitation that “the condensate flashing to steam in the low pressure region of the chamber if the condensate is at a temperature higher than the saturation temperature at the pressure of the low pressure region” is simply an inherent thermodynamic property of steam at given conditions related to the steam’s pressure and temperature compared to its saturation temperature under low pressure conditions. The steam/condensate fluid in Moore would display the same behavior under the stated conditions in Claim 24.

***Claim Rejections - 35 USC § 103***

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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9. Claims 3-6 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borg et al. in view of Freimann (5,573,029).

Borg et al. disclose all the features of the claimed invention except that the vortex chamber has a portion that is frusto conical. Freimann discloses the use of a cylindrical inlet chamber (2) followed by the frusto conical section (4) of the chamber (col.5, lines 14-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a frusto conical section of the vortex chamber after the cylindrical section of the inlet of the vortex chamber as disclosed by Freimann onto the vortex chamber of Moore, to create a channeling structure to aid in directing the flow of the fluid to the exit of the chamber.

10. Claims 2, 4, 5, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore as applied to claim 1 above, and further in view of Freimann (5,573,029).

Moore discloses all the features of the claimed invention except that the vortex chamber has a portion that is cylindrical. Freimann discloses the use of a cylindrical inlet chamber (2) followed by the frusto conical section (4) of the chamber (col.5, lines 14-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a cylindrical section at the inlet of the vortex chamber of Freimann before the frusto conical vortex chamber of Moore, to create a channeling structure to aid in directing the flow of the fluid to the exit of the chamber.

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11. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore in view of Scott, Jr. et al. (3,170,477).

Moore discloses a control element (entire device). Moore does not disclose that the vortex chamber is provided in a control element supported by a body provided with inlet and outlet passage, the inlet passage communicating with the inlet to the chamber and the outlet passage communicating with the escape aperture and further that the control element and the body abut each other at respective contact surfaces, the inlet and outlet passage opening at respective ports on the contact surface of the body, and the inlet and escape aperture communicating with respective ports at the contact surface of the control element. Scott, Jr. et al. disclose the use of a control element (25 and 42) supported by a body provided (20) with inlet (21) and outlet (31) passage, the inlet passage communicating with the inlet (24) to the chamber and the outlet passage (27) communicating with the escape aperture and further that the control element and the body abut each other at respective contact surfaces as seen in Figure 1, the inlet and outlet passage opening at respective ports on the contact surface of the body, and the inlet and escape aperture communicating with respective ports at the contact surface of the control element (col. 2, line 55 to col. 3, line 21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a body that houses a control element as disclosed by Scott, Jr. et al. to enclose the control element of Moore, in order to have a replaceable control element inside a protective housing.

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Regarding claim 11, Scott, Jr. et al. disclose that the control element is engageable with the body in any one of the plurality of different rotational positions.

Regarding claim 12, Scott Jr. et al. disclose the use of a circular groove in the contact face to provide for one of the passages.

12. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borg et al.

Borg et al. fail to disclose the diameter of the escape aperture. The examiner takes Official Notice that the diameter of the escape aperture is a results-effective variable, i.e. a variable that achieves a recognized result. In the instant case, the diameter of the escape aperture is directly proportional to the amount of condensate that can pass through the device. Since the diameter of the escape aperture is recognized as a results-effective variable, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen a escape aperture with a diameter not greater than 40 mm and more specifically not greater than 30 mm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

13. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore.

Moore fails to disclose the diameter of the escape aperture. The examiner takes Official Notice that the diameter of the escape aperture is a results-effective variable, i.e. a variable that achieves a recognized result. In the instant case, the diameter of the



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escape aperture is directly proportional to the amount of condensate that can pass through the device. Since the diameter of the escape aperture is recognized as a results-effective variable, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have chosen a escape aperture with a diameter not greater than 40 mm and more specifically not greater than 30 mm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (see MPEP 2144.05).

### ***Response to Arguments***

14. Applicant's arguments filed 9/26/08 have been fully considered but they are not persuasive. The applicant is arguing that the vortex chamber (29) of Moore is not a vortex chamber since there is additional structure that allows the fluid to be channeled in a rotational manner. The applicant further defines that a vortex chamber encompasses a spinning flow of fluid around a center defined by the fluid itself which is a vortex line. The chamber of Moore as disclosed spins around a centerline. This spinning fluid further opens into a portion of the chamber that is not enclosed by the conical structure of 27 along with the fins 30 that is immediately before the escape aperture 16. This portion of the chamber would meet the applicant's definition of a vortex chamber.

15. The applicant is further arguing that the condensate in Moore would not flash to steam in a low pressure region and therefore does not met the claim limitation of "the condensate at higher than the saturation temperature flashes to steam within the low

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pressure region and is discharged through the escape aperture as steam at a relatively low mass flow rate". The examiner disagrees with this and points to page 3, col. 1, lines 27-33 in which Moore discloses that condensate at high temperatures flashes into vapor and is discharged into the low pressure chamber 17 as vapor.

16. Applicant's arguments with respect to claims 9-12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRAIG M. SCHNEIDER whose telephone number is (571)272-3607. The examiner can normally be reached on M-F 8:00 -4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Huson can be reached on (571) 272-4887. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. S./  
Examiner, Art Unit 3753  
October 14, 2008

/Stephen M. Hepperle/  
Primary Examiner, Art Unit 3753